## Space Weather Forecast

Issued on Wednesday, 29 May 2024 at 13:23 Local

**This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales**

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**Space Weather Forecast Headline: Ongoing likelihood of Moderate flares, and chance of isolated Strong flares.**

**Analysis of Space Weather Activity over past 24 hours**

**Solar Activity:** Moderate with four moderate-class flares, mostly from the new region in the southeast. although the largest came from a region in the northeast. Of the nine sunspot regions on the solar disc, these are the main two of interest. The northeast region is moderately sized, with some potential instability due to mixing of its magnetic polarity, along with some slow ongoing development. The southeast region was the source of the Strong flare on 27 May from around the limb, and has continued to gradually move onto the Earth-facing side This is still difficult to fully assess, but also shows some mixing of magnetic polarities and continues to have bright and extensive magnetic looping evident above the region in imagery from the SDO spacecraft. This suggests the potential for further notable flares.

There were no Earth-directed Coronal Mass Ejections (CMEs) observed in available imagery.

**Solar Wind / Geomagnetic Activity:** Solar winds were indicated of slow wind conditions, with background speeds observed, around or below 350km/s. Interplanetary Magnetic Field (IMF) was weak, with the north-south component predominately positive (northward). Geomagnetic activity was Quiet (Kp 0-2).

**Energetic Particles / Solar Radiation:** The count rate of energetic particles (high energy protons) remained at background with no solar radiation storms occurring.

**Four-Day Space Weather Forecast Summary**

**Solar Activity:** Moderate to High activity is expected with a likelihood of further Moderate class flares, and a chance of isolated Strong-class flares. These most likely from the spot near the southeast limb, which produced a Strong flare early on 27 May. The moderately sized spot in the northeast also has the potential to produce similar strength flares.

**Solar Wind / Geomagnetic Activity:** There are no Earth-directed CMEs. Background winds are expected to persist with no notable enhancements currently forecast through the period. Geomagnetic activity is forecast to be mainly Quiet with a slight chance of Unsettled intervals.

**Energetic Particles / Solar Radiation:** The count rate of energetic particles (high energy protons) is forecast to persist at background with no solar radiation storms occurring. This is despite the potential for Strong flares, with both sunspots in a position that is less likely to direct particles towards Earth.

**Geomagnetic Storms:**

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| Geo-Magnetic Storm Probability (Exceedance) | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Minor or Moderate | G1 to G2 | No | 1 | 1 | 1 | 1 |
| Strong | G3 | No | 1 | 1 | 1 | 1 |
| Severe | G4 | No | 1 | 1 | 1 | 1 |
| Extreme | G5 | No | 1 | 1 | 1 | 1 |

**Radio Blackouts - X Ray Flares:**

| X Ray Flares Probability | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | R1-R2 M Class | Yes | 75 | 70 | 60 | 60 |
| Very Active | R3 to R5 X | No | 25 | 25 | 20 | 20 |

**Solar Radiation Storms - (High Energy Protons):**

| Radiation Storms Probability (Exceedance) | Level ($cm^{-2}$ $sr^{-1}$ $s^{-1}$) | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | ≥ S1 | No | 10 | 10 | 10 | 10 |
| Very Active | ≥ S3 * | No | 1 | 1 | 1 | 1 |
| * S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$) | | | | | | |

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